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MAHARISHI DAYANAND SARASWATI UNIVERSITY, AJMER

PROPOSED RESEARCH WORK FOR
REGISTRATION AS STUDENT FOR THE DEGREE
OF Ph.D. IN BOTANY

ON

PHYTO-DIVERSITY AND ECOLOGICAL STUDIES OF PTERIDOPHYTES OF TODGARH – RAOLI WILD LIFE SANCTUARY, RAJASTHAN, INDIA

By
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Under Supervision of

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APPENDIX – IV

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

Format for Outline of Proposed Research work
(To be supplied in six copies)

1. Name of Scholar (In English) : **RAHUL MOURYA**

(In Hindi) : राहुल मौर्य

2. Title of the Research Work:

(In English) : **PHYTO-DIVERSITY AND ECOLOGICAL STUDIES OF PTERIDOPHYTES OF TODGARH – RAOLI WILD LIFE SANCTUARY, RAJASTHAN, INDIA**

(In Hindi) : "राजस्थान के टॉडगढ–रॉवली वन्यजीव अभयारण्य में पाये जाने वाले टेरिडोफाइट्स की पादप विविधता और पारिस्थितिकी का अध्ययन"

3. Location

a. Institution/Department where The work is to be done : Department of Botany
S.P.C.Government College, Ajmer
Rajasthan (305001)

b. Geographical area of : Ajmer and Rajsamand districts, Rajasthan

28/05/2015

Signature of the Candidate with date

Outline Approved

Name and Signature of supervisor with date & seal –

28/05/16

Lecturer (Dr. Dilip Gena)
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PROPOSED RESEARCH WORK

PHYTO-DIVERSITY AND ECOLOGICAL STUDIES OF PTERIDOPHYTES OF TODGARH – RAOLI WILD LIFE SANCTUARY, RAJASTHAN, INDIA

Geographical Area of study:-

TODGARH – RAOLI WILD LIFE SANCTUARY STUDY AREA –A PROFILE

Rajasthan state is situated in the northwestern part of India between $23^0 3'$ and $30^0 12'$ N latitude and $69^0 3'$ and $78^0 12'$ E longitude. The Aravalli ranges which is one the oldest mountain range of the world, it run across the state from northeast to southwest for nearly 692kms and Main topographic feature of Rajasthan is Aravalli range. Todgarh-Raoli Wildlife Sanctuary located in central position of Aravalli range and northern side of Kumbhalgarh hills of Rajasthan between $25^0 38'$ and $26^0 58'$ north latitudes and $73^0 54'$ and $75^0 22'$ east longitudes. It is bounded on the north by Ajmer district, on the south by Udaipur district, on the east by Rajshamand district and on the west by Pali district. It occupies about 495 square kilometers of tropical deciduous forests and grassland area. The sanctuary is located pretty much in the middle of the Aravalli range and 25 kilometer far from Todgarh and Jassa kheda village on NH-8 Delhi-Udaipur highway.

Introduction

Aravalli range divides the state into two vegetation segments western xerophytic segment and southern mesic segment. This range lies between both segments and thus it is an ecotone zone. This sanctuary is the transition zone of both vegetation segments. Xerophytic and mesic vegetation occurs as mixed formation. Due to this ecotone nature great phyto-diversity is represented in the floral element.

In the proposed research work mainly the habit, habitat, topography distributions, ecology, drought resistant, moisture contents, total bound water, and conservational methods by tribal and local people will be investigated in details. The floristic and ecological information will mainly present in the proposed research.

Objectives

The present study will highlight the floristic richness along with ecological and environmental investigation of the sanctuary. The observations on the above aspects and future research will be investigate.

1. Field survey(Botanical excursions)- To observe pattern of climatic changes in the local area, with respect to rainfall, humidity temperature along with soils for habit, habitat and taxonomical studies.
2. To study the eco-climatic and soil characters of the region- To surveys various vegetational belts in Todgarh-Roali wild life sanctuary Rajasthan. Quantitative analysis and distribution of important plants have been conducted.

3. To prepare a floristic analysis (Check-list & enumerations) of Todgarh-Raoli wildlife sanctuary and systematic study will be investigate & Distribution series.
4. To study the plant species on the basis of their distribution patterns.
5. To point out some important RET (Rare, Endangered and Threatened) plants of the sanctuary.
6. The photographic plates showing habit and habitat of flora will also be prepared for documentation purpose.

Review

Floristic Studies

After the publication of Duthie's "Flora of Upper Gangetic Plain 1903-1930" the floristic contributions from Rajasthan were negligible till 1950, since than however, a large number of papers have been published on the vegetation of Aravalli. A notable contribution are those of Mulay & Ratnam (1950), Nair & Nathwat (1956), Joshi (1957, 58), Sharma (1958), Jain & Kotawat (1960), Vyas (1964, 65, 67), Gupta & Bhardwaja (1965), Parmar & Singh (1985), etc.

The publication of the "Flora of the Indian desert" Bhandari (1990). "Flora of north-east Rajasthan" (Sharma & Tiagi 1979) and Flora of Rajasthan (Shetty &

Singh 1989-1991) have further added to our Knowledge of Flora and Floral composition of Rajasthan. Unrecorded ethno-medicinal uses of biodiversity from Todgarh-Raoli wild life sanctuary, Rajasthan were reported by Jain, et al., (2007). Ecotaxonomic investigation of Ajmer district was done by Janu (1998), Floristic Analysis of the vegetation of Beawar tehsil with special reference to ecophysiological study was done by Gupta (2000), Taxonomical and ecological study of vegetation of Deedwana, Nagaur and Ajmer District has been done by Quereishi (2000), Yadav (2000), Biodiversity of medicinal plants from central Aravalli's of Rajasthan was given by Bharadwaj *et. al*. (2011), Studies of Biodiversity of Sariska Tiger Reserve with particular emphasis on medicinal and endemic plants has been carried out by Dular, (2013). Flora of south Central Rajasthan has been published by Meena & Yadav (2014).

Ecological Studies

The aridity and other factors influencing the vegetation in the west side of Aravalli have attracted the attention of whole nation and also UNESCO. As a result of a number of lists of plants and account on vegetation of Rajasthan have been published during last five decades because Aravalli is transition zone of both botanical segments and also represent in variety of diversity patterns. Yet Todgarh –Roali wild life sanctuary was neglected with biodiversity aspects since last two decades. Plants grow in a very distinctive way and plants growth follows same rule. The difference in growth reflects difference in ecological and environmental factors. Plants that survive in their habitats show particular adaptations. Prakash & Sen. (1988) reported that among various methods of Plant adaptation under arid conditions seed polymorphism is a common feature in plants. Sarup (1952) has mentioned that most of the plants in Indian desert i.e. *Capparis aphylla* and *Euphorbia royleana* have no leaves but are merge twigs; Sen. (1973) has recognized leaflessness as a characteristic's physiognomic feature of the Indian Arid Zone vegetation. The role of environmental factors on seed germination has been stressed by Bisnoi & Gautam (1991). The diversity patterns and relationship of environmental factors with vegetation in Todgarh-Roali regions are not well documented yet.

Research Gaps

The aridity and other factors influencing the vegetation in the west side of Aravalli have attracted the attention of whole nation and also UNESCO. As a result of a number of lists of plants and account on vegetation of Rajasthan have been published during last five decades because Aravalli is transition Zone of both botanical segments and also represent and variety in diversity patterns. . Yet Todgarh –Roali wild life sanctuary was neglected biodiversity aspects since last two decades.

In recent year a large number of publications dealing with the Flora, Floral compositions, Ecology etc of Rajasthan have been published however the Flora of Todgarh-Roali Wild life sanctuary has sadly been neglected except for a few brief studies.

Significance of the study

It hoped that this research will fill up the gaps in our knowledge about various parameters of diversity of this interesting and ancient segment of flora. This would lead to a valuable contribution for evolving the conservational strategies for this fast depending group of plants.

The present research will carry out the prospectus in phyto-diversity related with the enumeration of flora and its habits and habitats and occurrence in different parts of Todgarh-Raoli forest.

The research provides valuable information for the students of taxonomy, ecology. It is also related with morphology, photochemistry, Environmental studies, and Life sciences.

Inter-disciplinary relevance

The investigation will provide valuable information for the student of taxonomy, ecology and may prove useful in numerous fields related to taxonomy, systematic, ecology and flora. It is also related to morphology, cytology, photochemistry, environmental studies, and life sciences.

The experimental studies related to ecology will be very useful from the point of view of environmental biology. The present investigation will throw light on the present distributional pattern and status of plants in different habitats of Todgarh Raoli wild life sanctuary, Rajasthan.

The erosion of plant biodiversity is a matter of global concern. One by one the building blocks of entire ecosystem are disappearing. The 2008 IUCN Red Data list shows that in India hundreds of plants are under the list of threatened and at the risk of extinction.

Research Methodology

The present research is based on the Phyto-diversity, ecology and conservation of taxa in different parts of Todgarh Raoli wild life sanctuary in Rajasthan. It shall been carried out along the following lines:-

- Survey and collection: All the localities will be visited time to time and again throughout the year but mainly during monsoon period. The Botanical excursions will be undertaken from time to time. Field trips will be arranged in such a way as to cover all the localities at more or less regular intervals to collect most of the Plants.
- Rainy season that is from July to October each year is the best time and attempt to visit as many places for the study habit and habitats of plants.
- Collection and Identification of taxa.
- Material of plants will be collect from different localities of sanctuary for live cultivation and for preservation in FAA. At least 10 herbarium sheet of each taxon of particular localities shall be prepared.
- Efforts will be made to identify the plants from fresh materials and common name in use by local people. The species shall be identified with the help of the floras.
- Photographic documentation of these plants will also be prepared including habit and habitat for the purpose of e-learning.
- Species belonging to genus will be arranged in the genus cover which shall beard the numbers as allotted in the systematic of plants.
- Details of habits, habitats and soil characteristics will regularly recorded during the collection tours for ecological studies.

- Drought resistance, moisture contents, total bound water, total free proline, photosynthetic pigment, total protein, and total starch, total sugar will be investigated.
- Due to the great variety of habitat conditions and consequently great diversity in flora and vegetation types. The subject of conservation of plant resources is very complex in Rajasthan yet different conservational studies which concern to local people and tribal's will be investigated in this purpose.

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